UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

Terry Erlewine
General Manager
State Water Contractors
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Dear Mr. Erlewine:

Thank you for your letter dated March 28, 2012, regarding the technical workshop on estuarine habitat we convened on the preceding day. Your letter identified three principal concerns, and this letter addresses each concern.

1. Government Transparency: EPA is adhering to the Memorandum you cited and has long been committed to conducting the public's business in an open fashion. The technical workshop was an example of our approach to transparency. The workshop was designed to engage a diverse set of scientists in discussing technical questions pertaining to estuarine ecology and hydrodynamics. We limited the size of the group in consultation with the facilitator to ensure a rich and manageable dialogue among many voices. In addition to scientists from federal and State agencies, we invited scientists and engineers from non-governmental organizations that hold diverse viewpoints, including three individuals affiliated with water agencies that contract water from the CVP and SWP. Non-participating observers and members of the public were welcome to attend the event, and we worked with the host agency, CalEPA, to accommodate everyone interested.

2. Focus of the Workshop: The scientific work done under the auspices of the San Francisco Estuary Project (1991-1993) documented a statistically significant link between the position of the 2‰ isohaline (X2) and the reproduction and survival of various components of the estuarine ecosystem. The scientific findings were based upon the analysis of salinity data going back to the 1960s, and many years of interagency research on fish abundance. Since then, a great deal of scientific research has reinforced the link between X2 and the fate of some fish populations, and has also suggested that X2 positioning by itself cannot always guarantee a predictable outcome.

We designed this workshop to take advantage of all the scientific progress made since the early 1990s toward understanding the estuarine ecosystem. Three-dimensional computer models can now characterize the reach and extent of the low salinity zone (LSZ) at different outflows. To support the dialogue at the workshop, EPA performed a literature review of the significant scientific papers done since 1995 on X2 and the LSZ. We are confident that we examined the strongest scientific evidence available in identifying areas of agreement, disagreement, and uncertainty.

Your letter explores a number of stress factors pertaining to the threatened delta smelt. However, under the Clean Water Act, EPA is concerned with all the beneficial uses associated with estuarine habitat, not just with the preservation of rare and endangered species (abbreviated as "RARE" in the classification system). These other beneficial uses include commercial and sport fishing (COMM), fish migration (MIGR), and warm freshwater habitat (WARM).

Regarding delta smelt, we appreciate your discussion of Cache Slough as a refuge for the species. EPA strongly supports the conservation and restoration of aquatic habitat within the Cache Slough Complex consistent with the State's implementation of the TMDL for methylmercury in the Delta. Moyle and Yoshiyama (1994)[1] made a compelling argument for the designation of aquatic diversity management areas so that multiple populations of imperiled fishes could be established in different locations across their respective ranges. By creating "redundant" populations, resource managers can guard against the loss of an entire species if a catastrophic event destroys the refuge for a lone population of a given species. This is relevant to the Delta where sunken islands and the fragile levees make the region vulnerable to disaster.

Stabilizing and restoring the landscape encompassing the estuarine zone benefits all water users by protecting the State's water quality, water supply, and aquatic life. Conserving and restoring the Cache Slough Complex is an excellent complement to protecting the estuarine zone between the western Delta and the Carquinez Strait. Regardless of what is done elsewhere in the Bay Delta ecosystem, there will always be a need to protect the estuarine zone for its many beneficial uses.

3. Questions of the Workshop: Your letter itemizes some other stressors on aquatic life, i.e., food availability, predators, ammonium loading, and increases in the nitrogen-to-phosphorus (N:P) ratio. EPA agrees these are important factors, and we are actively engaged in other forums to address these stressors in partnership with the State Water Resources Control Board, the Regional Water Boards, and the regulated community. The forum on we held on March 27th was focused on the low salinity zone. Many found the workshop enlightening and productive, thanks in large part to the fine contributions of the invitees, the pertinent questions asked, and the structure provided by the facilitator.

Please let me know if you wish to discuss this matter further at (415) 972-3469 or vendlinski.tim@epa.gov.

Sincerely,

Timothy John Vendlinski 05/22/12
Senior Policy Advisor
Water Division

[1] Peter B. Moyle & Ronald M. Yoshiyama (1994): Protection of Aquatic Biodiversity in California: A Five-tiered Approach, Fisheries, 19:2, 6-18. http://dx.doi.org/10.1577/1548-8446(1994)019<0006:POABIC>2.0.CO;2

March 29, 2012

Tim Vendlinski
Senior Policy Advisor
Office of the Director (WTR-1)
EPA Pacific Southwest Region
75 Hawthorne Street
San Francisco, CA 94105-3901

Re: Technical Workshop on Estuarine Habitat in the Bay Delta Estuary: Managing LSZ to Improve Estuarine Habitat and Protect Fish Populations (March 27, 2012)

Dear Mr. Vendlinski:

The San Luis & Delta-Mendota Water Authority[1] reviewed the letter the State Water Contractors submitted to you regarding the U.S. Environmental Protection Agency's Technical Workshop on Estuarine Habitat in the Bay Delta Estuary: Managing the Low Salinity Zone to Improve Estuarine Habitat and Project Fish Populations, that was held on March 27, 2012. The Water Authority joins with the SWC in its three principal concerns:

> First, the workshop undermined the policy of the United States to conduct business with transparency, public participation, and collaboration by prohibiting meaningful public participation;
>
> Second, the workshop's sole focus on X2 and the Low Salinity Zone (LSZ) was too narrow to develop information on improving estuarine habitat and Project fish populations, as the wealth of scientific knowledge supports a conclusion that factors other than X2 location and the LSZ are the primary factors affecting fish abundance and habitat needs; and
>
> Third, and related to the second concern, the workshop should have considered biotic and other habitat characteristics (such as food availability, predators, ammonium loading, and increases in the nitrogen-to-phosphorus (N:P) ratio).

Thank you for the opportunity to submit these comments.

Sincerely,

Daniel G. Nelson
Executive Director

[1] Attached hereto is a brief description of the Water Authority.

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The San Luis & Delta Mendota Water Authority is a joint powers authority, established under California's Joint Exercise of Powers Act. (Gov. Code, § 6500 et seq.). The Authority is comprised of 29 member agencies, 27 of which hold contractual rights to water from the federal Central Valley Project (CVP). The Authority member agencies have historically received up to 3,100,000 acre-feet annually of CVP water for the irrigation of highly productive farm land primarily along the San Joaquin Valley's Westside, for municipal and industrial uses, including within California's Silicon Valley, and for publicly and privately managed wetlands situated in the Pacific Flyway. The areas served by the Authority's member agencies span portions of seven counties encompassing about 3,300 square miles, an area roughly the size of Rhode Island and Delaware combined.

The Authority's members are: Banta-Carbona Irrigation District; Broadview Water District; Byron Bethany Irrigation District (CVPSA); Central California Irrigation District; City of Tracy; Columbia Canal Company (a Friend); Del Puerto Water District; Eagle Field Water District; Firebaugh Canal Water District; Fresno Slough Water District; Grassland Water District; Henry Miller Reclamation District #2131; James Irrigation District; Laguna Water District; Mercy Springs Water District; Oro Loma Water District; Pacheco Water District; Pajaro Valley Water Management Agency; Panoche Water District; Patterson Irrigation District; Pleasant Valley Water District; Reclamation District 1606; San Benito County Water District; San Luis Water District; Santa Clara Valley Water District; Tranquillity Irrigation District; Turner Island Water District; West Side Irrigation District; West Stanislaus Irrigation District; Westlands Water District.

March 28, 2012

Mr. Tim Vendlinski
Senior Policy Advisor
Office of the Director (WTR-1)
EPA Pacific Southwest Region
75 Hawthorne Street
San Francisco, CA 94105-3901

Re: Technical Workshop on Estuarine Habitat in the Bay Delta Estuary: Managing LSZ to Improve Estuarine Habitat and Protect Fish Populations (March 27, 2012)

Dear Mr. Vendlinski:

This comment letter expresses the concerns of the State Water Contractors[1] (SWC) regarding the EPA's Technical Workshop on Estuarine Habitat in the Bay Delta Estuary: Managing the Low Salinity Zone to Improve Estuarine Habitat and Project Fish Populations, that was held on March 27, 2012. The SWC has three principle concerns.

First, the SWC believes the workshop was inconsistent with important policies of the United States. On his first day in Office, President Obama signed the Memorandum on Transparency and Open Government. Through that Memorandum, President Obama committed to creating an unprecedented level of openness in Government. The President sought to ensure the public trust and establish a system of transparency, public participation, and collaboration. The President recognized:

> *"Transparency promotes accountability and provides information for citizens about what their Government is doing."*
>
> *"Public engagement enhances the Government's effectiveness and improves the quality of its decisions. Knowledge is widely dispersed in society, and public officials benefit from having access to that dispersed knowledge."*

[1] The State Water Contractors (SWC) organization is a nonprofit mutual benefit corporation that represents and protects the common interests of its 27 member public agencies in the vital water supplies provided by California's State Water Project (SWP). Each of the member agencies of the SWC holds a contract with the California Department of Water Resources to receive water supplies from the SWP. Collectively, the SWC members deliver water to more than 25 million residents throughout the state and more than 750,000 acres of agricultural lands. SWP water is served from the San Francisco Bay Area, to the San Joaquin Valley and the Central Coast, to Southern California. The SWC's members are: Alameda County Flood Control and Water Conservation District Zone 7; Alameda County Water District; Antelope Valley-East Kern Water Agency; Casitas Municipal Water District; Castaic Lake Water Agency; Central Coastal Water Authority; City of Yuba City; Coachella Valley Water District; County of Kings; Crestline-Lake Arrowhead Water Agency; Desert Water Agency; Dudley Ridge Water District; Empire-West Side Irrigation District; Kern County Water Agency; Littlerock Creek Irrigation District; Metropolitan Water District of Southern California; Mojave Water Agency; Napa County Flood Control and Water Conservation District; Oak Flat Water District; Palmdale Water District; San Bernardino Valley Municipal Water District; San Gabriel Valley Municipal Water District; San Gorgonio Pass Water Agency; San Luis Obispo County Flood Control & Water Conservation District; Santa Clara Valley Water District; Solano County Water Agency; Tulare Lake Basin Water Storage District.

> *"Collaboration actively engages Americans in the work of their Government."*
>
> Memorandum for the Heads of Executive Departments and Agencies, available at: www.whitehouse.gov/the_press_office/TransparencyandOpenGovernment/.

The ground rules for the workshop completely undermine the President's policy. They prohibited public engagement. While EPA "allowed" observers to attend the workshop to listen to the presentation and discussion, the observers were told they will be "assigned seats separate from the workshop participants" and they "will not engage in discussion with participants during the day (i.e., presentations, breaks, lunch, small group sessions."

Second, the SWC believes that the narrow focus of EPA's workshop—namely, on X2 and the Low Salinity Zone (LSZ) as supposed indicators of habitat for delta smelt and other Delta fish species—was misguided. That focus fundamentally ignores the wealth of scientific knowledge—most significantly, the results of several recently published life-cycle modeling efforts for delta fish species—supporting the conclusion that factors other than X2 location are the primary factors affecting fish abundance and habitat needs. The courts and the National Research Council have found that the use of X2 as a factor is poorly supported and of questionable value in protecting listed fish species (National Research Council 2010; Findings of Fact and Conclusions of Law Re Plaintiffs' Request for Injunctive Relief Against Implementation of RPA Component 3 (Action 4) August 31, 2011).

Third, the workshop asked the wrong questions if the goal is to identify viable conservation solutions to benefit the Delta and its listed species. A more helpful focus would be on the biotic and other habitat characteristics (such as food availability, predators, ammonium loading, and increases in the nitrogen-to-phosphorus (N:P) ratio) that appear to be more relevant as major drivers affecting fish abundance. EPA's emphasis on the concept of an LSZ, rather than on the fundamental mechanisms identified by the life-cycle models and elsewhere as adversely affecting fish and habitat, threatens to divert scarce public resources and scientific effort away from the critical issues affecting fish health and habitat. Accordingly, the focus of the workshop should have addressed the broader suite of variables at play in the Delta affecting listed fish species and their habitat.

Recent Life-Cycle Models Uniformly Conclude That X2 Location Is Not a Significant Factor Affecting Subsequent Delta Smelt Abundance

In the last three years, peer-reviewed delta smelt life-cycle modeling studies have been undertaken by Maunder & Deriso (2011), MacNally et al. (2010), Thomson et al. (2010), and Miller et al. (2012). These published works have assessed the importance of a suite of factors on Delta fish species, with particular focus on delta smelt. None of the studies found evidence of a relationship between the location of X2 in any season and subsequent delta smelt abundance.

Thorough analysis of data collected from California Department of Fish and Game (CDFG) Fall Midwater Trawl (FMWT), 20 mm, and Summer Townet (STN) surveys has also failed to identify any correlation between the location of X2 in the fall and delta smelt distribution, survival, reproduction, or food availability (Hanson 2011). These results are consistent with the conclusions reached in the delta smelt life-cycle modeling efforts that could not identify a relationship between X2 location and delta smelt abundance. The data indicate that fall X2 location is not limiting delta smelt abundance and population dynamics.

In addition, the National Research Council reviewed the studies relied upon in the 2008 Delta Smelt OCAP biological opinion for regulating the position of X2, including Feyrer et al. (2007), and questioned that study's introduction of unacknowledged uncertainty from improperly linking several statistical models and the lack of rigor in the analysis (National Research Council 2010). A federal district court also recently examined several of the aforementioned studies and analyses, including Feyrer et al. (2007, 2011), and reached the conclusion that current studies did not show a relationship between fall X2 location and subsequent delta smelt abundance (Findings of Fact and Conclusions of Law Re Plaintiffs' Request for Injunctive Relief Against Implementation of RPA Component 3 (Action 4) August 31, 2011). Indeed, the Feyrer studies themselves acknowledged that their analysis was limited and not appropriate for use as a regulatory mechanism (Feyrer et al. 2007). Thus, to the extent the EPA workshop proposes to revisit the issue of the purported relationship between fall X2 location and delta smelt abundance, that issue has already been addressed by the scientific community.

The EPA Workshop Should Have Focused on Examining Food Availability and Interactions With Ammonium Loading, Rather Than Simply the LSZ

Three of four modeling studies (Maunder & Deriso 2011, MacNally et al. 2010, and Miller et al. 2012) found that food availability was a significant driver of delta smelt abundance. Consistent with these modeling efforts, the available scientific data from CDFG surveys show evidence that zooplankton food supplies for delta smelt are an important factor affecting the species' population dynamics, while the location of fall X2 and associated estimates of "abiotic habitat area" do not appear to be strong predictors of delta smelt population dynamics.

Ammonium loading and the estuary's increasing N:P ratio are also known to affect springtime phytoplankton blooms and species composition. These drivers must also be considered when addressing habitat quality. However, care must also be exercised because ammonium loading is diluted when Delta inflow is higher. Therefore, higher productivity of Delta fish species during high outflow conditions has sometimes been mistakenly attributed to the location of the LSZ rather than the most likely mechanism of effect, namely, ammonium dilution. This circumstance is especially telling for species such as longfin smelt, which have shown a much stronger relationship with both phosphate and ammonium loading than with Delta outflow (Glibert et al. 2011). Thus, in order to achieve long-term recovery of the fish species of concern, ammonium loading in the Delta must be addressed in a way that does not simply require water supply to be appropriated for mitigating anthropogenic pollutants.

Importantly, since 1987, the introduction of Amur River clam, *Corbula amurensis*, in the Suisun Bay region has caused major changes in the availability and composition of food sources in the LSZ. This has had the effect of making Suisun Bay rearing habitat less desirable, while the Cache Slough region—approximately 40 km away to the north and far removed from the LSZ's influence—has maintained important characteristics, such as higher turbidity and food availability, that facilitate spawning and rearing of delta smelt. Recent survey efforts have shown substantial year-round populations of delta smelt in the north Delta.

Cache Slough Has Been Overlooked as a Region Containing Habitat for Delta Smelt

The FMWT data show that regulating State Water Project and Central Valley Project operations to manage the location of X2 in the fall is unnecessary to expand the geographic space that is utilized by pelagic fish species, such as delta and longfin smelt. Contrary to assumptions relied upon, for example, in the 2008 Delta Smelt OCAP biological opinion, FMWT data show that the distribution of delta smelt during the fall occurs over a wide range of environmental conditions, ranging approximately 40 km from Suisun Bay to the Cache Slough region. The LSZ is often referred to as stretching from 0.5 to 6 psu; however, survey data shows that delta smelt can be found at salinities substantially greater than 10 psu downstream from the LSZ, and they are frequently found in substantial numbers in freshwater portions of the Delta upstream from the LSZ.

Further, the existence of a year-round demographic unit of delta smelt in the Cache Slough region demonstrates that it is likely not a semi-anadromous species as previously believed (Baxter et al. 2010). Delta smelt appear to occupy wide areas of the Delta, tending to fill favorable habitat with appropriate biotic and abiotic conditions rather than simply uniformly migrating downstream (Hobbs et al. 2007). Recent delta smelt studies and surveys, including the STN and FWMT surveys from 2011, show substantial populations of delta smelt thriving year-round in the Cache Slough and Sacramento River Deep Water Ship Channel region, far removed from any effects from managing X2 or the LSZ. The FMWT did not begin surveying these regions until 2009, and the STN survey was not expanded to these areas until 2011. Thus, previous studies ignored a substantial region occupied by the delta smelt population. Indeed, a federal district court, relying on admissions made by the primary author of the studies, recently found that Feyrer et al. (2007, 2011) did not consider the region of Cache Slough. However, some of the highest densities of larva and juveniles have been sampled in this region in recent years, suggesting that the range of delta smelt spawning and rearing is much further away from Suisun Bay than previously believed. The current scientific consensus is that delta smelt are not restricted solely to the LSZ and that management efforts need to incorporate much more than just looking at X2 as a management tool for aiding the species' recovery and conservation. The EPA workshop revisits these established norms and thus looking at issues already addressed by the scientific community.

It is also beyond scientific dispute that habitat is a species-specific concept, and the habitat of a species includes the geographic areas it occupies, all the resources it uses, and the conditional states of those resources. X2 is a poor surrogate of habitat for delta smelt, not only because

much of the population resides in areas outside the LSZ, but also because many parts of the LSZ have not been occupied by delta smelt during most of the past decade despite those areas' regularly having salinities within the LSZ range. Thus, it is apparent that delta smelt habitat is not defined solely by salinity because the LSZ in autumn only weakly overlaps the distribution of delta smelt. Because extensive areas of the LSZ do not support delta smelt, much of the LSZ should not be considered habitat for delta smelt.

In addition, the delta smelt located in the upstream, freshwater environment of Cache Slough—which in recent years has comprised as much as one-third of the total numbers observed in surveys—are largely unaffected by winter and spring objectives related to X2 and outflow. Rather than migrating upstream to spawn and downstream to rear, the delta smelt appear to simply spread out into available habitat. Therefore, the requirement for transport flow in the winter and spring does not seem to be justified.

The Workshop's Focus Should Have Been Redirected Towards the Broader Suite of Factors That Affect Delta Fish Species Rather Than Simply The Location of X2 and the LSZ

The EPA workshop overlooked issues that affect conservation and restoration efforts in the delta. To the extent that the workshop's questions assume that regulating springtime X2 location will impact pelagic fishes in the delta, studies have not shown a correlation between delta smelt abundance and spring X2 (Jassby et al. 1995, Kimmerer et al. 2009). Further, a substantial portion of the population resides in the Cache Slough area that is largely unaffected by springtime outflow objectives. Responses by longfin smelt to spring outflow may in fact be responses to phosphate and ammonium loading and the effect that outflows have on dilution (Glibert et al. 2011).

The EPA workshop assumed or suggested that modifying the location of X2 and the LSZ will cause a relevant response from biological indicators and ecological processes to the benefit of pelagic fishes. The current state of scientific knowledge is to the contrary. As just two examples, productivity in the LSZ has been drastically limited by springtime suppression of phytoplankton blooms from ammonium loading and feeding by the *Corbula amurensis* clam, which has resulted in a reduced carrying capacity in the Suisun Bay region (Glibert 2010, Kimmerer 2009, Kimmerer 2006). Additionally, survey data undeniably show that longfin smelt thrive in a broad range of salinities, including downstream from X2, while delta smelt occupy a much larger area than just the LSZ (Baxter et al. 2010, Hanson 2011). These and other factors show that regulatory efforts should be directed toward life-cycle modeling related to the relevant fish species to help better determine what factors (e.g., decreasing ammonium loading and improving food supply) can be improved and how those factors can be improved. Singularly focused study sessions seeking to justify a pre-determined outcome that a one-size-fits-all variable is the solution are unlikely to meaningfully advance scientific understanding of the more complex interacting variables in the Delta ecosystem.

The workshop assumed that changing X2's location will affect aquatic organisms' reproduction, survival, abundance, and diversity. Currently available data do not support such an assumption. Historical survey data have failed to show evidence that such relationships exist (Hanson 2011). The workshop assumed further that mapping/quantifying the LSZ's location and modeling its changes under various scenarios will be useful. Current data show that such study is irrelevant because species such as the delta smelt utilize much broader ranges of the delta from Suisun Bay to Cache Slough and the LSZ is not likely a driving factor for species recovery, survival, and abundance.

Finally, the workshop also assumed that water management decisions and outflow variation change the value of estuarine habitat across all seasons of the year. The assumption is not supported by modeling results or any of the other most up-to-date scientific information. The SWC is legitimately concerned that the workshop presumed that the LSZ (and thus any impact from the State Water Project and Central Valley Project on the downstream extent of the LSZ) causes species abundance declines. In our view, such an effort could unintentionally be used to bolster supposed scientific support for a flawed hypothesis, rather than focusing on the true drivers of species abundance that would improve habitat for delta fishes and assist efforts to help listed fish and the Delta ecosystem. Rather than revisiting hypotheses that have not shown scientific viability, the workshop should have focused on developing means with real potential for solving Delta conservation issues by furthering the efforts in life-cycle modeling related to species-specific factors that have been identified as supporting the recovery of delta fishes. Accordingly, the focus of the workshop should have been adjusted to address these concerns.

Thank you for the opportunity to submit these comments.

Sincerely Yours,

Terry L. Erlewine
General Manager